Effects of Planting Date and Polymer-Coated Seed on Corn

James Jensen, farm management specialist
ISU Extension
Kevin Van Dee, farm superintendent

Introduction

This project was designed to study the effect that polymer-coated seed has on corn emergence and yield. The coating technology used is the Intellicoat® Early Plant™ Seed Coating Technology. Intellicoat is derived from natural, biodegradable fatty acids that act as temperature-sensitive switches. Thus when soil temperatures warm above 55°F for several days, the polymer allows water to permeate the seed, which in turn allows germination to proceed.

There is interest in this technology because it opens up a window for earlier planting. Southeast Iowa is often dry enough to plant during the second half of March or the first half of April, but producers usually delay planting during this period because the soil is still too cool. Unfortunately, when soils do warm later in the spring, wet soil conditions may occur, resulting in planting delays. The Intellicoat technology is designed to allow producers the opportunity to plant when soils are cool but otherwise fit.

Materials and Methods

The third and fourth years of this study at the Southeast Research and Demonstration Farm were in 2004 and 2005, respectively. The corn was planted into ground that was in soybeans the previous year. A John Deere 7000 planter was set to plant 32,000 seeds/acre in 30-in. rows. Attachments included Yetter bubble-type coulter blades and Martin residue managers. Phosphorus and potassium were broadcast in the fall prior to each study. In addition, anhydrous ammonia was applied in the fall prior to the 2004 study and in the spring prior to the 2005 study.

The study was randomized and replicated three times. A fourth block was used for demonstration purposes and was not randomized. A representative from the Landec Ag Company chose the corn hybrids that were planted. Both polymer-coated and noncoated seed were planted. Each seed type was planted at approximately two-week intervals throughout the early spring.

Results and Discussion

Planting conditions were good for all planting dates during the 2004 and 2005 seasons. There were periods of warm weather in late March and early April during both years that allowed the polymer-coated seed to begin germinating prematurely. In 2004, both the polymer-coated and noncoated seed performed equally well; however, there was a slight delay in emergence with the polymer-coated seed when planted later in the spring (Table 1). In 2004, yields were highest with the early planting dates for both the polymer-coated and non-coated treatments (Table 2). Yields for the last planting date in 2004 were approximately 20 to 40 bushels/acre less than for the earliest date.

In 2005, the early, warm weather allowed the polymer-coated corn to germinate along with the noncoated seed. A personal observation is that the first planting date of the polymer-coated seed emerged uniformly and had ideal stands, while the noncoated seed emerged slowly and had less than ideal stands. This observation suggests that the polymer coating protected the seed early in the growing season. Good stands were observed in the second planting date in 2005 with both the polymer-coated and noncoated seed; however, the polymer-coated seed emerged more slowly. This delay was also observed with the last two planting dates in 2005.

The warm weather early in the spring of 2005 was followed by unusually cold weather during late April and early May. The weather was cold enough to kill many corn seedlings in the early planting-date treatments. Plant counts at the V5 stage revealed that the stand counts for the first two planting dates were poor (Table 3). Interestingly, the circumstances mentioned above that delayed emergence in the noncoated seed in the first planting date and the polymer-coated seed in the second planting date resulted in better stands (Table 3) and better yields (Table 2) than when the crop emerged more quickly.

The 2005 spring weather was a rare occurrence. Nevertheless, this season showed that along with the risk of delayed planting because of a wet spring there is also risk in planting too early. Producers need to decide for themselves whether the risk of having to replant polymer-coated corn is greater than the risk of delayed planting because of wet weather.

Acknowledgments

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Table 1. Corn emergence[1] and population[2] as influenced by planting date and polymer coating, Southeast Research and Demonstration Farm, 2004.

Planting date	Date emerged/Population (noncoated seed)	Date emerged/population (coated seed)	Days to emergence (noncoated/coated)
March 22	April 19/28,900ppa	April 19/31,400ppa	28/28
April 5	April 22/31,100ppa	April23/32,400ppa	17/18
April 19	May 6/31,400ppa	May 7/32,900ppa	17/18
May 3	May 11/31,400ppa	May 14/33,800ppa	8/11

[1] Emergence recorded when approximately 75% of plants emerged.
[2] Plants/acre (ppa) at approximately the V5 growth stage.

Table 2. Corn grain yield as influenced by planting date and polymer coating, Southeast Research and Demonstration Farm, 2004–2005.

Noncoated/coated seed (2004)		Noncoated seed/coated seed (2005)	
Planting date	Yield (bushels/acre)	Planting date	Yield (bushels/acre)
March 22	224/220	March 14	75/25
April 5	222/224	March 30	2/117
April 19	207/209	April 14	185/186
May3	183/203	April 28	180/172

Table 3. Corn emergence[1] and population[2] as influenced by planting date and polymer coating, Southeast Research and Demonstration Farm, 2005.

Planting date	Date emerged/population (noncoated seed)	Date emerged/population (coated seed)	Days to emergence (noncoated/coated)
March 14	April 16/6,800ppa	April 13/900ppa	33/30
March 30	April 14/200ppa	April 17/11,900ppa	15/18
April 14	April 30/31,400ppa	May 7/29,600ppa	16/23
April 28	May 11/31,000ppa	May 13/32,400ppa	13/15

[1] Emergence recorded when approximately 75% of plants emerged.
[2] Plants/acre (ppa) at approximately the V5 growth stage.